



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/730,545	12/07/2000	Ulrich Faber	016778/0421	9343
22428	7590	04/05/2004	EXAMINER	
FOLEY AND LARDNER SUITE 500 3000 K STREET NW WASHINGTON, DC 20007			NG, CHRISTINE Y	
			ART UNIT	PAPER NUMBER
			2663	

DATE MAILED: 04/05/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/730,545

Applicant(s)

FABER, ULRICH

Examiner

Christine Ng

Art Unit

2663

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 07 December 2000.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-22 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-5, 7, 8, 10-12, 15, 16 and 18 is/are rejected.
- 7) ☒ Claim(s) 6, 8-17 and 19-22 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 07 December 2000 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 3-5.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

## DETAILED ACTION

### *Claim Rejections - 35 USC § 112*

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claims 8, 10-12, 15 and 16 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 8 recites the limitation "producing means" in line 3 of the claim. There is insufficient antecedent basis for this limitation in the claim.

Claim 10 recites the limitation "the frequency storage section" in lines 3-4 of the claim. There is insufficient antecedent basis for this limitation in the claim.

Claim 10 recites the limitation "the plurality of the stages" in line 4 of the claim. There is insufficient antecedent basis for this limitation in the claim.

Claim 10 recites the limitation "the input register" in line 4 of the claim. There is insufficient antecedent basis for this limitation in the claim.

Claim 11 recites the limitation "the later frame selector" in line 1 of the claim. There is insufficient antecedent basis for this limitation in the claim.

Claim 11 recites the limitation "the plurality of the stages" in line 2 of the claim. There is insufficient antecedent basis for this limitation in the claim.

Claim 11 recites the limitation "the input register" in line 2 of the claim. There is insufficient antecedent basis for this limitation in the claim.

Claim 12 recites the limitation "the plurality of the stages" in lines 1-2 of the claim. There is insufficient antecedent basis for this limitation in the claim.

Claim 12 recites the limitation "the input register" in line 2 of the claim. There is insufficient antecedent basis for this limitation in the claim.

Claim 12 recites the limitation "the frequency storage section" in line 2 of the claim. There is insufficient antecedent basis for this limitation in the claim.

Claim 12 recites the limitation "the candidate register" in line 5 of the claim. There is insufficient antecedent basis for this limitation in the claim.

Claim 12 recites the limitation "the stages of the input register" in line 5 of the claim. There is insufficient antecedent basis for this limitation in the claim.

Claim 12 recites the limitation "the later frame selector" in line 6 of the claim. There is insufficient antecedent basis for this limitation in the claim.

Claim 15 recites the limitation "the frequency storage section" in lines 1-2 and 3-4 of the claim. There is insufficient antecedent basis for this limitation in the claim.

Claim 15 recites the limitation "the stages" in line 3 of the claim. There is insufficient antecedent basis for this limitation in the claim.

Claim 16 recites the limitation "the stages" in line 2 of the claim. There is insufficient antecedent basis for this limitation in the claim.

***Claim Rejections - 35 USC § 102***

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

4. Claims 5 and 7 are rejected under 35 U.S.C. 102(a) as being unpatentable by U.S. Patent No. 6,108,372 to Tidemann Jr. et al.

Referring to claim 5, Tidemann Jr. et al disclose in Figure 2 a method of predicting a frame rate ( $R_t$ ) in a selected one of frames (frame at time  $t$ ) that follows a reference frame (frame at time  $t-1$ ) with a reference frame rate ( $R_{t-1}$ ). The "probability of receiving a data frame at a given rate may be defined to be conditioned on the actual rates of the previous frames of data" (Column 8, lines 17-19). The method comprises the step of statistically processing (Column 8, Equation 4) the reference frame rate ( $R_{t-1}$ ) and a previous frame rate ( $R_{t-2}$ ) of a previous frame (frame at time  $t-2$ ) preceding the reference frame (frame at time  $t-1$ ) to calculate a frame rate candidate ( $R_t$ ) in the selected one of the frames (frame at time  $t$ ). The statistical processing step involves the probability distribution shown by Equation 4 (Column 8, line 34), where the rate of the current frame ( $R_t$ ) is based on the rates of 'n' previous frames. Tidemann Jr. et al disclose an example of when the current frame rate ( $R_t$ ) is based on the transitional characteristics of the two previous frame rates ( $R_{t-1}$  and  $R_{t-2}$ ). Refer to Column 8, lines 22-29. The method also comprises producing the frame rate candidate ( $R_t$ ) as the frame rate ( $R_t$ ) predicted. Processor 40 "will determine the most probable data rate conditioned on the previous n actual data rates and present it to decoder 34"; decoder 34 will then "decode the frame at this most probable data rate" (Column 8, lines 43-46).

Referring to claim 7, Tidemann Jr. et al disclose in Figure 2 a circuit operable in response to a sequence of frame rate signals ( $R_{t-n}$ ) derived from a sequence of

reception signals in a wireless communication device of a mobile communication system, the reception signal sequence including a reference frame (frame at time  $t-1$ ), a previous frame sequence (frame at time  $t-2$ ) preceding the reference frame (frame at time  $t-1$ ), and a later frame (frame at time  $t$ ) following the reference frame (frame at time  $t-1$ ) while the circuit is used for calculating a later frame rate ( $R_t$ ) of the later frame (frame at time  $t$ ). The circuit comprises processing means (processor, Element 40) for statistically processing (Column 8, Equation 4) a reference frame rate ( $R_{t-1}$ ) extracted from the reference frame (frame at time  $t-1$ ) and a previous frame rate ( $R_{t-2}$ ) extracted from the preceding frame sequence (frame at time  $t-2$ ) to successively store a frame rate candidate ( $R_t$ ) in the later frame (frame at time  $t$ ) as a result of statistically processing. The circuit also comprises selecting means (processor, Element 40) for selecting the frame rate candidate ( $R_t$ ) to produce the frame rate candidate ( $R_t$ ) as the later frame rate ( $R_t$ ). Refer to the rejection of claim 5.

***Claim Rejections - 35 USC § 103***

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 1-4 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,108,372 to Tidemann Jr. et al in view of U.S. Patent No. 6,480,554 to Toskala et al.

Referring to claim 1, Tidemann Jr. et al disclose in Figure 2 a wireless communication device for use in a DS/CDMA mobile communication system, the wireless communication device being operable in response to a sequence of reception signals divisible into a plurality of frames each of which has a frame rate ( $R$ ) and which is further divided into a plurality of slots. The device comprises processing means (processor, Element 40) for statistically processing (Column 8, Equation 4) preceding frame rates ( $R_{t-n}$ ) in previously received ones of the frames (frames before time  $t$ ) to produce a result of statistical processing. The device also comprises predicting means (processor, Element 40) for predicting a later one of the frame rates ( $R_t$ ) in a next one of the frames (frame at time  $t$ ) on the basis of the result of statistical processing (Column 8, Equation 4) to produce a predicted frame rate ( $R_t$ ) of the later one of the frame (frame at time  $t$ ). Refer to the rejection of claim 5.

Tidemann Jr. et al does not disclose that the device comprises executing means for executing a predetermined operation within candidate ones of the slots determined for the predicted frame rate.

Toskala et al disclose in Figure 1A an executing means (channel estimator, Element 37) for executing a predetermined operation (channel estimation) within candidate ones of the slots determined for the predicted frame rate. The rate estimator (Element 40) "estimates the transmission rate which has been utilized by examining the structure of the despread data" (Column 6, lines 17-19). The estimated transmission rate,  $R_{est}$ , is obtained by determining how much of the data slot is filled with data, since at different transmission rates, a different portion of the time slot is empty. Refer to

Column 4, lines 27-34 and Column 6, lines 11-41. The rate, Rest, is an "indication of how much of the time slot is filled with data, or whether the time slot is empty" (Column 6, lines 34-36). The channel estimator (Element 40) uses Rest to perform channel estimation since channel estimator "cannot be carried out on data symbols within a time slot due to uncertainties as to whether or not the data would actually exist" and channel estimation is "confused by parts of the time slot in which there was no transmission" (Column 6, lines 2-6). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to include executing means for executing a predetermined operation within candidate ones of the slots determined for the predicted frame rate; the motivation being for different frame rates, a different portion of the time slot of filled with data and there needs to be a means to determine what slots are filled with data so that channel estimation can be performed on the data.

Referring to claim 2, Tidemann Jr. et al disclose that the result of statistical processing is successively renewed so as to be matched with a variation of environment. The probability distribution (Column 8, Equation 4) is successively provided with the recent frame rate so that it can use it to determine the frame rate for the next frame. Refer to Column 8, lines 53-55.

Referring to claim 3, Tidemann Jr. et al does not disclose that the executing means comprises a spread code generator for generating a spread code, and a calculating unit for calculating the candidate slots from the predicted rate and the spread code.



Toskala et al disclose in Figure 1A that the executing means (channel estimator, Element 37) comprises a spread code generator (Element 22) and a calculating unit (rate estimator, Element 40) for calculating the candidate slots from the predicted frame rate and the spread code. The predicted frame rate is calculated by the calculating unit (rate estimator, Element 40). "The rate estimator estimates the transmission rate which has been utilized by examining the structure of the despread data" (Column 6, lines 17-19). The spread code from the spread code generator (Element 22) is provided to the calculating unit (rate estimator, Element 40) through elements 34, 35 and 36a and is used for detecting signals dedicated to a particular mobile station. Refer to Column 5, lines 4-38 and Column 6, lines 11-15. The rate determined from rate estimator (Element 40), Rest, is an "indication of how much of the time slot is filled with data, or whether the time slot is empty" (Column 6, lines 34-36). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to include that the executing means comprises a spread code generator for generating a spread code, and a calculating unit for calculating the candidate slots from the predicted rate and the spread code; the motivation being that the spread code generator is needed to allow the mobile station to search for signals which have been transmitted with the unique spreading code for a particular mobile station and the frame rate is needed since different frame rates transmit in different time slots.

Referring to claim 4, Tidemann Jr. et al do not disclose a demodulating unit for demodulating the reception signal with reference to the candidate slots into a demodulated signal.

Toskala et al disclose in Figure 1A a demodulating unit (Element 38) that demodulates reception signals with reference to the candidate slots. The transmission rate determined from the rate estimator (Element 40),  $R_{est}$ , is sent to channel estimator (Element 37) so that it can carry out channel estimation on time slots with data and then provide this information to the demodulation unit, allowing demodulation to occur only when data is present in time slots. Refer to Column 5, lines 42-49 and Column 6, lines 36-41. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to include a demodulating unit that demodulates reception signals with reference to the candidate slots; the motivation being to allow demodulation to occur only when data is present in time slots.

7. Claim 18 is rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,108,372 to Tidemann Jr. et al.

Referring to claim 18, Tidemann Jr. et al disclose in Figure 2 a method of predicting a latest frame rate ( $R_t$ ) of a latest received frame (frame at time  $t$ ) from preceding frame rates (rates of frames before time  $t$ ). The method comprises the step of extracting a sequence of frame rate signals ( $R_{t-n}$ ) from a sequence of reception signals (frames before time  $t$ ). The method also comprises the step of predicting the latest frame rate ( $R_t$ ) of the latest received frame (frame at time  $t$ ) by processing previous ones of the frame rate signals ( $R_{t-n}$ ) preceding the latest received frame (frame at time  $t$ ). Refer to the rejection of claim 5.

Tidemann Jr. et al do not disclose that the predicting of the latest frame rate ( $R_t$ ) is done in consideration of a delay time for extracting the frame rate signal sequence.

However, Tidemann Jr. et al disclose that in variable rate systems with explicit rate information, the rate is included as part of the variable rate frame and is not recoverable until the frame has been decoded, leading to decoding delay. There is also decoding delay when rates are sent in the non-variable portion of the frame. Refer to Column 1, line 58 to Column 2, line 3 and Column 2, lines 31-47. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to include that the predicting of the latest frame rate ( $R_t$ ) is done in consideration of a delay time for extracting the rate signal sequence; the motivation being that at the receiving end, there is always some decoding delay associated with decoding the rate information from frames in order to determine transmission rate.

***Allowable Subject Matter***

8. Claims 6, 8-17 and 19-22 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.


***Conclusion***

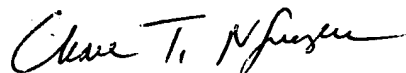
9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Christine Ng whose telephone number is (703) 305-8395. The examiner can normally be reached on M-F; 8:00 am - 5:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nguyen Chau can be reached on (703) 308-5340. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Art Unit: 2663

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

C. Ng   
March 30, 2004



CHAU NGUYEN  
SUPERVISORY PATENT EXAMINER  
TECHNOLOGY CENTER 2600